REMARKS

In a supplemental Advisory Action of January 8, 2008, the Examiner has maintained his rejection of Claims 99 and 115. In an in-person interview of April 10, 2008, attended by the undersigned, Peter Berger, David Welkie, Examiner Nguyen and Examiner Kim it was agreed that the issue remaining in this case is whether or not there is support for the limitation "providing a delay" in the application. Applicant believes that there is adequate support in the instant specification and in parent patent US 5,689,111 as described in detail below.

During the above-mentioned interview Applicant clarified that the delay in Claims 99 and 115 refer to **the delay between the release of one ion packet from the guide and the subsequent pulsing of that ion packet from the TOF pulsing region into the TOF flight tube for mass to charge analysis**. This is explicit in the wording of clause (e), which states: "providing a delay between the release of the pulses of trapped ions AND initiation of push-pull pulses in the time of flight instrument."

The following is Applicants' response to the Advisory Action of January 8, 2008. Applicants' argument showing support for the term "delay" follows thereafter.

In the above-mentioned supplemental Advisory Office Action, the Examiner has stated:

"[Applicants] argument is not persuasive and is incomplete to responding the features stated in page 2 of the final office action mailed on 10-18-2007. The following are answered for the above-argument:

1) The data of original application serial No. 09/676,124 did not indicate "which is a CON of 09/373,337, which is a CON of 08/794,970, which is a CON of 08/645,826, which is a CON of 08/202,505". Therefore, the data of original application serial No. 09/676,124 may be needed to correct;
2) Claims 99 and 115 recite the method for operating a Time-Of-Flight mass spectrometer for effecting mass analysis on an ion stream. They are not recited the chemical reaction Therefore, the drawings must show every

feature of the invention specified in the claims 99 and 115 such as a delay device and an adjusting delay device;

3) The pulse signal is carried to release individual ion packets. It never had a delay in the pulse signal. Even, if the delay was in the pulse signal, then the delay in the pulse signal is different with the delay recited in claims 99 and 115;
4) The above-statements do not recite any meaning that is relative to the limitation "adjusting the delay to improve the duty cycle efficiency of ions with the second mass to charge ratio". Further, Applicant argued that the delay would be inherently in the timing release of individual ion packets, between successive individual packets. How is the delay adjusted when the delay is inherently in the timing release of individual packets, between successive individual packets?

It is noted that Applicant is requested to prove the subject matters (all the limitations) recited in claims 99 and 115 are disclosed in each of the current application and all continuation applications See MPEP 201.07)."

RESPONSE

Applicant offers the following explanation and clarification in response to the above-mentioned items:

Item 1: It should be noted that Applicants rely on US Patent No. 5,689,111 as a basis for additional support for the pending Claims. The current application is a continuation in part of 09/808,468 (US 7,019,285), which is a continuation of abandoned application 09/448,857, which is a continuation of 08/971,521 (US 6,020,586), which is a continuation of 08/689,459 (US 5,689,111). This chain of applications is clearly set forth in the corrected filing receipt. The Examiner has requested for Applicant to prove that the subject matter recited in Claims 99 and 115 are disclosed in the current and parent applications. In response, Applicant submits that the current application is a continuation in part of application Ser. No. 09/808,468. The Specification has accordingly been amended to recite the same (see amendments to the Specification). Because the current application is a continuation in part, the Examiners requirement pursuant to MPEP 201.07 is no longer warranted.

To the extent that the data of original application Ser. No. 09/676,124 did not cite the chain of applications referenced by the Examiner, it should be noted

that application Ser. No. 09/676,124 is abandoned and is not being relied on for support of the Claims. Applicant will therefore not address this issue at this time.

Item 2: In the interview of April 10, the Examiner agreed that in as much as Claims 99 and 115 are method Claims there is no need to show particular devices for carrying out the method.

Items 3 and 4: Applicants believe that the Examiner's rejections in items 3 and 4 were as a result of a fundamental misunderstanding of Applicants' arguments previously submitted. Applicants therefore offer the following clarification: The Examiner appears to be interpreting the 'delay' referred to in step (e) of claims 99 and 115 as a delay between the release of one ion packet and the next ion packet from the ion guide trap. However, Applicants clarify that the delay in Claims 99 and 115 refer to **the delay between the release of one ion packet from the guide and the subsequent pulsing of that ion packet from the TOF pulsing region into the TOF flight tube for mass to charge analysis**. This is explicit in the wording of clause (e), which states: "providing a delay between the release of the pulses of trapped ions AND initiation of push-pull pulses in the time of flight instrument."

Applicants submit that a misunderstanding could have arisen by an inadvertent omission of a phrase in the Office Action Reply, page 4, lines 13-14. That is, the phrase "providing a delay between the release of the pulses in the time of flight instrument, and adjusting ..." should have read "providing a delay between the release of the pulses ***of trapped ions and initiation of push-pull pulses*** in the time of flight instrument, and adjusting..."

Applicants' position with regard to items 3 and 4 will be more clearly understood with the discussion below:

SUPPORT FOR "DELAY"

As discussed in the interview of April 10, the only remaining substantive issue in this case is whether the use of the term 'delay' in count 1, step (e) is adequately supported, given that this term does not appear in the specification of the instant application (that is, without considering the parent US Pat. No. 5,689,111)

This step reads:

> "(e) providing a delay between the release of the pulses of trapped ions and initiation of push-pull pulses in the time of flight instrument, and adjusting the delay to improve the duty cycle efficiency of ions with the second mass-to-charge ratio;"

Applicants argue, as in previous Office Action Responses, that sufficient support for this step is found in the current specification, and that even stronger support is found in parent U.S. Patent No. 5,689,111

To reiterate the arguments presented in previous Office Action Responses, it was stated:

"We contend that support for step (e) is found initially in the instant specification pg. 24, lines 8-10 which state:

> "Instead, *trapping and the timed release of ions* from the multipole ion guide *is a preferred method for improving duty cycle*."

This teaching introduces the concept of improving the duty cycle by a process of trapping ions and properly timing their release to the TOF. This concept is elaborated on, following a detailed discussion of different ways of performing the trapping step, in subsequent passage on pg. 26, line 6 – pg. 27, line 5:

> "By either trapping method, ions continuously enter ion guide 16 even while ion packets are being pulsed out exit end 24. The time duration of the ion release

> from ion guide exit 24 will create *an ion packet 52 of a given length* as diagrammed FIG. 2. As *this ion packet moves through lenses 27 and into pulsing region 30 some m/z TOF partitioning can occur* as diagrammed in FIG. 3. The m/z components of ion packet 52 can occupy different axial locations in pulsing region 30 such as separated ion packets 54 and 56 along the primary ion beam axis. Separation has occurred due to the velocity differences of ions of different m/z values having the same energy. The degree of m/z ion packet separation is in part a function of the initial pulse duration. The longer the time duration that ions are released from exit 24 of ion guide 16, the less m/z separation that will occur in pulsing region 30. *All or a portion of ion packet 52 may fit into the sweet spot of pulsing region 30. Ions pulsed from the sweet spot in pulsing region 30 will impinge on the surface of detector 38.* If desired, a reduced m/z range can be pulsed down flight tube 42 from pulsing region 30. This is accomplished by controlling the length of ion packet 52 and *timing the release of ion packet 52 from ion guide 16 with the TOF pulse of lenses 34 and 35. A time separated m/z ion packet consisting of subpackets 54 and 56 just before the TOF ion pulse occurs is diagramed in FIG. 3.* Ion subpacket 56 of lower m/z value has moved outside the sweet spot and will not hit the detector when accelerated down flight tube 42. Ion subpackets 57, originally subpackets 54, are shown just after the TOF ion pulse occurs. These subpackets will successfully impinge on detector 38. The longer the initial ion packet 52 the less mass range reduction can be achieved in pulsing region 30. *With ion trapping in ion guide 16, high duty cycles can be achieved* and some degree of m/z range control in TOF analysis can be achieved independent or complementary to mass range selection operation with ion guide 16."

This passage first describes a pulse, or packet, of ions of a given length (depending on the trap pulse duration) being pulsed out of the ion guide trap. Then, "*As this ion packet moves through lenses 27 and into pulsing region 30 some m/z TOF partitioning can occur...*". In other words, it takes some time for the pulsed ion packet to travel from the ion guide trap to the pulsing region of the TOF, and, obviously, the TOF push-pull pulse would not be activated until the ion

packet, or some portion of the packet, has arrived within the TOF 'sweet spot', that is, the region within the TOF pulse region from which ions are able to reach the TOF detector once the TOF pulse occurs. This time delay is expressed explicitly in this passage by "...*timing the release of ion packet 52 from ion guide 16 with the TOF pulse of lenses 34 and 35. A time separated m/z ion packet consisting of subpackets 54 and 56 just before the TOF ion pulse occurs is diagramed in FIG. 3.*" Clearly, '...timing the release of ion packet...with the TOF pulse...' is the same as 'providing a delay between the trap release of the pulses of trapped ions and the initiation of push-pull pulses in the time of flight instrument.' Such a delay is even more explicitly described in the '111 description, as discussed below."

Notwithstanding the even more explicit support found in the parent '111 patent, the continuing issue seems to be whether '...timing the release of ion packet...with the TOF pulse...', as found in the instant specification, is really the same as the phrase in step (e), 'providing a delay between the trap release of the pulses of trapped ions and the initiation of push-pull pulses in the time of flight instrument.' Applicants contend that the 'timing' of one event with a second event can only mean to impose a time relation between the two events. Since it clear that the TOF pulse must come after the release of the ion packet from the ion trap, since the ion packet takes some time to travel from the ion trap exit to the TOF pulse region, the phrase found in the instant application, '...timing the release of ion packet...with the TOF pulse...', can only mean exactly the same thing as the phrase in count 1, step (e), 'providing a delay between the trap release of the pulses of trapped ions and the initiation of push-pull pulses in the time of flight instrument.'

The Examiner contends that the word 'delay' means essentially that an event occurs later than expected, such as, when a bus is late, it has been 'delayed', or when some process or activity lasts longer than it should have, such as when a baseball game is 'delayed' on account of rain. Consequently, the Examiner argues that the term 'delay', as it is used in count 1, would not

necessarily be understood to mean '...timing the release of ion packet... with the TOF pulse...'. In other words, the Examiner argues that the term 'delay' would not be understood to describe the 'timing' of two events – one being the release of trapped ions and the other being the TOF pulse – as described in the instant specification. However, this is precisely the meaning of 'delay' as it used in the Sciex '027 patent, as well as in the Analytica patent '111, the parent of the instant application.

In any case, the Examiner may be correct that one colloquial use of the term 'delay' is to describe when some event occurs later than anticipated, or when some activity takes longer than expected. However, in any technical art involving the time coordination of two or more electronically generated pulses, including the art of the instant specification, that is, time-of-flight mass spectrometry, the term 'delay' is, in fact, used precisely to describe the time relation, or 'timing', between two electronic pulses, or events. Hence, the 'timing' of one event with another event, and a 'delay' between two events, means exactly the same thing to those skilled in the art.

Support for this contention can be found in many sources. For example, the following is found in the on-line source Wikipedia regarding devices well-known as 'delay generators':

> **"From Wikipedia, the free encyclopedia**
>
> Jump to: navigation, search
>
> A **digital delay generator** is a piece of electronic test equipment that provides precise delays for triggering, syncing, delaying and gating events. The digital delay generator is similar to a pulse generator in function but with a digital delay generator the timing resolution is much finer and the delay and width jitter much less.
>
> Some manufacturers, calling their units **digital delay and pulse generators**, have added independent amplitude polarity and level control to each of their outputs in addition to both delay and width control. Now each channel provides its own delay, width and amplitude control, with the triggering synchronized to an external source or internal rep rate generator - like a general-purpose pulse generator.

Some delay generators provide precise delays (edges) to trigger devices. Others provides precise delays and widths to also allow a gating function. Some delay generators provide a single channel of timing; others provide multiple channels of timing.

Digital delay generator outputs are typically logic level, but some offer higher voltages to cope with electromagnetic interference (EMI) environments. For very harsh environments, optical outputs and/or inputs, with fiber optic connectors, are also offered as options by some manufacturers. In general, a delay generator operates in a 50 ohm transmission line environment with the line terminated in its characteristic impedance to minimize reflections and timing ambiguities.

Historically, digital delay generators were single channel devices with delay-only (see DOT reference below). Now, multi-channel units with delay and gate from each channel are the norm. Some allow referencing to other channels and combining the **timing** of several channels onto one for more complex, multi-triggering applications. Multiple-lasers and detectors can be triggered and gated. (see second reference on "Experimental study of laser ignition of a methane/air mixture by planar laser-induced fluorescence of OH." Another example has a channel pumping a laser with a user-selected number of flash lamp pulses. Another channel may be used in Q-switching that laser. A third channel can then be used to trigger and gate a data acquisition or imaging system a distinct time after the laser fires. (see sensorsportal.com reference below) A delay generator can also be used to delay and gate high speed photodetectors in high speed imaging applications. (see reference on high speed photography below)

Digital delay generators are usually the heart of the timing for larger systems and experiments. Users generally create a GUI, graphical user interface to provide a single control to the entire system or experiment. Digital delay generator manufacturers have added remote programming schemes that facilitate the creation of such GUI's. Industry standards such as GPIB, RS232, USB and ethernet are available from a variety of manufacturers.

Experimental fluid dynamics uses digital delay generators in its investigations of fluid flow. The field of PIV, particle image velocimetry, encompasses several subsets which would use digital delay generators as the main component of its timing where multiple lasers may be triggered. Multiple channels may trigger multiple laser. A single channel with multiplexed timing or operating in a burst mode may trigger a laser with multiple pulses.

LIDAR applications use digital delay generators. A channel is used to trigger a laser. A second channel is used to provide a delayed gate for the

data acquisition system. Gating allows regions of interest to be processed and stored while ignoring the bulk of unwanted data."

Clearly, from this description, a 'delay' is well-known to those skilled in the art to refer to the controlled time period from one electronic pulse or transition to a subsequent pulse or transition. Further, the incorporation of a delay between two or more pulses is referred to as the 'timing' of the two or more pulses. Hence, the phrase found in the instant application, '...timing the release of ion packet...with the TOF pulse...', is understood by the skilled person to mean the same as 'providing a delay between the trap release of the pulses of trapped ions and the initiation of push-pull pulses in the time of flight instrument' of count 1 step (e), because it is well understood that 'timing two events' means 'providing a delay between the first and second event'.

This is well understood not only in the art of time-of-flight mass spectrometry instrumentation, but also in the art of many technical disciplines, such as in the art of integrated circuit developments, in which the timing between two applied voltage pulses must be controlled. Hence, there are commercial products that have been known and available for decades which provide the specific capability of generating two voltage pulses, where a second voltage pulse can be generated a definite and controlled time period after the first voltage pulse. This time period is referred to generally as the time 'delay' between the two pulses, and, equivalently, such delay generators are generally known to be used to control the 'timing' between the two pulses. Hence, the commercial products that provide this capability are referred to generally as 'delay generators' or 'digital delay generators'

For example, one typical commercial product is the Model DG535 Digital Delay Generator manufactured and sold by Stanford Research Systems.

According to the web site for this product (http://www.thinksrs.com/products/DG535.htm):

"**Features and Specifications**

The DG535 Digital Delay and Pulse Generator provides four precisely-timed logic transitions or two independent pulse outputs. The delay resolution on all channels is 5 ps, and the channel-to-channel jitter is less than 50 ps Front-panel BNC outputs deliver TTL, ECL, NIM or variable level (-3 to +4 V) pulses into 50 Ω or high impedance loads. The high accuracy, low jitter, and wide delay range make the DG535 ideal for laser timing systems, automated testing, and precision pulse applications.

Delay Outputs

There are four delay output channels: A, B, C and D. The logic transitions of these outputs can be delayed from an internal or external trigger by up to 1000 seconds in 5 ps increments. The T0 pulse, which marks the beginning of a timing cycle, is generated by the trigger signal. The insertion delay between an external trigger and the T0 pulse is about 85 ns.

Delays for each channel may be "linked" to T0 or any of the other delay channels For instance, you can specify the delays of the four channels as:

A = T0 + 0.00125000
B = A + 0.00000005
C = T0 + 0.10000000
D = C + 0.00100000

In this case, when the A delay is changed, the B output will move with it. This is useful, for instance, when A and B specify a pulse and you want the pulse width to remain constant as the delay of the pulse is changed. Regardless of how the delay is specified, each delay output will stay asserted until 800 ns after all delays have timed out. The delays will then become unasserted, and the unit will be ready to begin a new timing cycle.

Pulse Outputs

In addition to the four delay outputs, there are four pulse output channels: AB, -AB, CD and -CD. The leading edge of the AB pulse coincides with the leading edge of the earlier of A or B, and the trailing edge of AB coincides with the leading edge of the later of B or A. For instance, in the previous example, a 50 ns pulse would appear at the AB output and a 1 ms pulse at CD. Pulses as short as 4 ns (FWHM) can be generated in this manner. The complementary outputs (-AB and -CD) provide a pulse with identical timing and inverted amplitude."

It is clearly understood from this description that the time difference between the time of one output transition or pulse and another output transition or pulse is called the 'delay' between the two output transitions or pulses, and

that providing such a delay is the same as 'timing' one output with respect to the other output.

Similar delay generators from other manufacturers include: Model 565 Digital Delay Pulse Generator from Berkeley Nucleonics; the Model 416A Gate and Delay Generator from Ortec; the Model 2323A Gate/Delay Generator from LeCroy; the Model V850/V851 4- and 6-Channel Digital Delay Generators; and the Model 9650A precision four channel digital delay generator from Signal Recovery, which, from their web site, states: "for general timing use (especially acceleration pulse timing) in TOF-MS systems". This is further evidence that timing one pulse with another in TOF MS systems is the same as providing a delay between the pulses.

In U.S. Patent No 5,689,111, col. 2, lines 39-50, the timing between the pulsed release of ions from the ion trap and the pulsed acceleration of ions in the TOF is described in terms of the timing between these two pulses:

> "Also unique to this embodiment is the fact that the ion packet pulse out of the linear two dimensional multipole ion guide forms a low resolution time of flight separation of the different m/z ions into the pulser where the timing is critical between when the pulse of ions are released from the linear two dimensional multipole ion guide and the time at which the pulser is activated. This is to say that the linear two dimensional multipole ion guide pulse time and the delay time to raise the pulser can be controlled to achieve 100% duty cycle on any ion in the mass range or likewise a 0% duty cycle on any ion in the mass range or any duty cycle in between."

This passage demonstrates in a document prior to the instant specification that the timing between the trap release pulse and the TOF pulse is the same as the delay time between the two events.

Further, U.S.patent No. 4,988,879 claims a method as follows:

> "26. In a method for generating a burst of gaseous ions of a solid organic material comprising the steps of
> a. providing the solid organic material as a deposit on a non-porous, inorganic oxide, solid support surface,
> b. striking the deposit with a pulse of a first laser to desorb the deposit off of the surface and give rise to a cloud of gaseous molecules of the organic material, and
> c. thereafter passing through the cloud of gaseous molecules a beam of a second laser to effect ionization of a portion of the gaseous molecules which it strikes, thereby producing the burst of gaseous ions;
> the improvement comprising employing as the beam of the second laser a pulse of the second laser and timing the pulse to contact the largest fraction of the gaseous molecules."

Support for this claim is found in col. 9, line 62 through col. 10, line 21, which states:

> "In a preferred embodiment of the overall ionization process of this invention, the sample ... is deposited as a solid film (i.e., a layer) on an inorganic oxide surface. ... A laser beam having the properties of wavelength and fluence suitable for desorbing and vaporizing but not ionizing the solid sample is directed upon the film for a controlled time period adequate to effect desorption and vaporization. Neutral molecules are generated in a fast desorption process. ... The cloud of desorbed molecules then expands into the high vacuum chamber between two electrodes which form the acceleration region of a linear time of flight ("TOF") mass spectrometer. In a second step these molecules are ionized by a beam (preferably a pulse) of an ultraviolet laser having the properties of wavelength, fluence and pulse duration to bring about resonance-enhanced multiphoton ionization ("REMPI") of the vaporized molecules

An appropriate delay between the desorbing laser pulse and the ionizing laser pulse is chosen so that the ionizing laser pulse intercepts as many molecules as possible.

....

The time delay between the two laser pulses should be such as to permit the ionizing laser beam to contact as many particles as possible. Generally, this is achieved when the period from the beginning of desorption to the beginning of ionization is adjusted on the order of from about 20 to about 180 usec and preferably from about 30 to about 150 usec."

Hence, the 'timing' between the two laser pulses referred to in the claim is described in the specification as a delay between the two laser pulses, demonstrating equivalence between 'timing two pulses' and 'providing a delay between two pulses' Therefore, similarly, there should be no ambiguity when equating the phrase in count 1 step (e) of the instant application, 'providing a delay between the trap release of the pulses of trapped ions and the initiation of push-pull pulses in the time of flight instrument.', and the description in the text of the instant application, '...timing the release of ion packet...with the TOF pulse...'.

In any case, there should be absolutely no confusion regarding step (e) when the descriptions in parent patent '111 are also considered, as was reviewed in the Office Action Reply of December 18, 2007, but which the Examiner seems to have failed so far to take into account Those argument are repeated below:

The above arguments for support for step (e) are further bolstered by considering the U.S. Patent No. 5,689,111, which describes in explicit detail the pulsed release of ions from an ion guide trap, and the improvement in duty cycle of an ion with a particular mass-to-charge ratio by adjusting the

delay between the release of the pulses of trapped ions and initiation of TOF pulses. In the '111 description, Col 8, lines 1-28 read:

> "As an example to the ion storage mode of operation, let us again use the same mixture of ions M1, M2, and M3 of ionic masses 997, 508 and 118 as used above in continuous mode of operation. As shown in FIG. 4, and FIG. 6 the pulsed ion beam of duration t1 from the region 72 is injected between the parallel plates 23 and 24 when the plates are initially held at the absence of an electric field, i.e. voltage level 79 on the repeller lens 23. According to the above equation (3), lighter ions moving faster than the heavier ions, the three masses will start to separate from each other in the region 26. After a certain variable delay t2, the electric field in the region 26 is pulsed on for a short period of time t3 by the repeller plate 23. The delay time t2 can be changed to allow different sections of the original ion beam, i.e. different m/z packages, to accelerate perpendicular to their original direction towards the flight tube 35 to be detected for mass analysis. In this example, a delay time t2 was chosen to pulse only a narrow range of ions centered around mass (M2) 53 which were accelerated in the direction 63 at the instant the field was turned on. At the same instant, both the masses M1 52 and M3 54 will hit the sides of the lenses moving in the approximate direction 62 and 64 and will not be detected by the mass analyzer."

This passage describes 'providing a delay (i.e., t2) between the release of the pulses of trapped ions and initiation of push-pull pulses in the time of flight instrument,' in the passage "After a certain variable delay t2, the electric field in the region 26 is pulsed on" , while 'and adjusting the delay to improve the duty cycle efficiency of ions with the second mass-to-charge ratio' is described by "...delay time t2 can be changed to allow... different m/z packages... to be detected for mass analysis... a delay time t2 was chosen to pulse only a narrow range of ions centered around mass (M2) 53...". The resulting improvement in the duty cycle is demonstrated in the subsequent

description of demonstrated experimental results in Col. 8, lines 44-67 through Col 9, lines 1-16, which read:

> "FIGS. 7A and 7B show the actual experimental results acquired using both the continuous and ion storage mode of operations for a sample using a mixture of ions used in the above examples. The actual sample was a mixture of three compounds Valine, tri-tyrosine, and hexa-tyrosine. Upon electrospray ionization of this mixture, the predominant molecular ions with nominal masses 118, 508, and 997 are generated in the ionization source 10. The bottom trace of FIG. 7A shows all three of these ions detected and registered as peaks 73, 71, and 74 when the mass spectrometer was in the continuous mode of operation. The top trace mass spectrum in FIG. 7A shows the results when the mass spectrometer was changed to the ion storage mode of operation. Both modes were acquired in similar experimental conditions. The acquisition rate i.e. the repetition rate counted by the repeller lens was 8200 per second. Each trace represents 4100 full averaged scans. As seen from the top spectral trace, there is only one predominant registered peak 72 in the spectrum. This peak corresponds to a molecular ion 508 enhanced in signal strength by about a factor of ten with respect to the peak 71 in continuous mode of operation. For the reasons explained in above examples, both of the molecular ions 118 and 997 are absent from the ion storage mode spectral trace as expected. The signal intensity increase comes from the fact that all of the ions that would otherwise be lost in the continuous ion mode were actually being stored in the ion guide for the next scan. According to the above example, for the continuous mode of operation, the approximate duty cycle calculated for the 508 peak at 8,200 scans/s would be 9% i.e. one out of every twelve ions being detected. As the experimental results suggest in the ion storage mode of operation at 8,200 scans/s in FIG. 7A, most of the lost ions predicted in the continuous ion mode were recovered.

This passage demonstrates a molecular ion 508 enhanced.. signal strength by about a factor of ten with respect to the peak 71 in continuous mode of

operation ... when the mass spectrometer was changed to the ion storage mode of operation, that is, as described in the previous passage, by providing a delay between the trap release and the TOF pulse and adjusting the delay to maximize the intensity of the m/z 508 ion, resulting from an improvement in duty cycle relative to continuous beam operation.

Hence, there is sufficient support for step (e) in the current description only, and even stronger support when considering the description of parent patent '111.

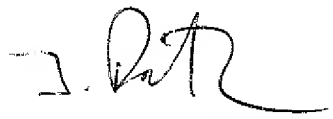
While the explicit description of the method step (e) is discussed in detail in the May 19, 2004 Response, as reiterated above, the means for performing this method step (e) is further described explicitly in the '111 patent, col. 7, line 59 through col. 8, line 6:

> "FIG. 6 shows the driving mechanism and the timing sequence between the ion guide exit lens 15 and the time-of-flight repeller lens 23 for a single cycle, i.e. a single mass spectral scan. The trace 83 shows the ion guide exit lens voltage status switching between the two voltage levels 77 and 78 and the trace 82 shows the repeller lens voltage status switching between the two levels 79 and 80. The power supply 91 sets the desired upper and lower voltage levels to be delivered to the lenses at all times. The electrically isolated fast switching circuitry 92 controls synchronously the desired voltage levels of the lens electrode 15 and the repeller plate 23 to be switched back and forth during the designated time intervals controlled by the pulse and delay generating device 93, which is an accurate timing device, which in turn is controlled by the user interface."

In particular, this passage teaches explicitly that "a pulse and delay generating device 93 ... controlled by the user interface" is the means used to adjust the delay.

Applicant believes that as a result of the above clarification, argument and amendment, the Examiner will agree that the pending Claims are supported by the Specification and interfere with US patent No. 6,285,027. It is thus respectfully requested that an interference is accordingly declared.

Respectfully submitted,



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